

NEW TAXA AND NAME CHANGES IN MEXICAN *PECTIS* (ASTERACEAE)

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ABSTRACT

Two new species, *Pectis amplifolia* Keil and *P. exilis* Keil, are described and illustrated, the former from southern Oaxaca and the latter from localities scattered from Jalisco to Oaxaca. New combinations, *P. elongata* H.B.K. var. *fasciculiflora* (DC.) Keil and *P. holochaeta* (S.F. Blake) Keil, are proposed, and *P. holochaeta* var. *cana* Keil is described as new. Chromosome numbers of $n=12$ are reported for both varieties of *P. holochaeta*.

KEY WORDS: *Pectis*, Asteraceae, México, systematics, chromosomes.

RESUMEN

Se describen y se ilustran dos especies nuevas, *Pectis amplifolia* Keil y *P. exilis* Keil, la primera del sur de Oaxaca y la segunda de varias localidades entre Jalisco y Oaxaca. Se proponen combinaciones nuevas, *P. elongata* H.B.K. var. *fasciculiflora* (DC.) Keil y *P. holochaeta* (S.F. Blake) Keil, y se describe *P. holochaeta* var. *cana* Keil. Se reportan números de cromosomas de $n=12$ para ambas variedades de *P. holochaeta*.

In ongoing monographic studies of *Pectis* (Asteraceae) I have discovered several unnamed taxa. Those from México are described here and two new combinations are proposed.

Pectis amplifolia Keil, *spec. nov.* (Figure 1). TYPE: MÉXICO. Oaxaca: Mpio. Jamiltepec, Pinotepa Nacional, 75 m, 25-31 Dec 1974, L.W. Boege 3349 (HOLOTYPE: MEXU).

Herbae perennes(?), caulibus plus quam 40 cm longis, erectis(?), crassis, purpurascens, in lineis puberulis, glabris; odor foliorum ignotus. Folia oblanceolata vel obovata, plus minusve succulenta, 3.5-5 cm longa, 1-2 cm lata, in ramis floribus reducta et

bractiformia, apicem versus late rotundata, basin versus decrescentia, 1-2 paribus nervorum ascendentium pinnate nervata, prope basim 1-2 paribus setarum 1-4 mm longarum ciliata, in superficie ambabus glabra vel subglabra, in superficie abaxiale punctata glandibus pellucidis circularibus numerosis circa 0.2 mm diametro. Capitula aliquot usque ad numerosa in cymis dichasialibus foliatis; pedunculi 2-4 cm longi, minute puberuli, 5-6 bracteolis dispersis alternantibus lanceolatis squamiformibus circa 1 mm longis. Involucra campanulata vel subcylindracea; phyllaria 4-7, oblongo-oblancheolata, 5-5.5 mm longa, 1.2-2.2 mm lata, glandibus pellucidis oblongis vel linearibus punctata, apice ciliolata, aliter glabra. Flosculi radii 5-7; corollae 6-8 mm longae. Flosculi disci circa 20; corollae circa 4 mm longae, bilabiatae labio anteriore anguste circa 1.5 mm longo, 4-5-plo longiore quam 4 lobis labii posterioris. Achenia flosculi radii 2.5-3 mm lata, adaxiale dense puberula, abaxiale glabra, epapposa, singulatim decidua con phyllariis subtentibus. Achenia flosculi disci 2-2.5 mm longa, uniforme sparse puberula; pappus setaceus setis circa 25, inaequalibus, 2-4 mm longis, antrorse scabridis. Chromosomatum numerus ignotus.

Perennial(?), stems more than 40 cm long, erect(?), stout, purple, sparingly puberulent in lines, glabrate; scent of herbage, if any, unknown. Leaves oblanceolate or obovate, \pm succulent, 3.5-5 cm long, 1-2 cm wide, reduced and bractlike on flowering branchlets, at apex broadly rounded, tapering at base, pinnately veined with 1-2 pairs of ascending lateral nerves, basally ciliate with 1-2 pairs of bristles 1-4 mm long, glabrous or nearly so on both surfaces, on abaxial surface dotted with numerous circular pellucid glands ca 0.2 mm in diameter. Heads several to many in open leafy bracted, dichasial cymes; peduncles 2-4 cm long, minutely puberulent, bearing 5-6 scattered alternate lanceolate scale-like bractlets ca 1 mm long. Involucres campanulate or subcylindric; phyllaries 5-7, oblong-oblancheolate, 5-5.5 mm long, 1.2-2.2 mm wide, dotted and streaked with oblong to linear pellucid glands, apically tufted-ciliolate, otherwise glabrous. Ray florets 5-7; corollas 6-8 mm long. Disk florets ca 20; corolla ca 4 mm long, bilabiate with the narrow anterior lip ca 1.5 mm long, 4-5 times the length of the 4 lobes of the posterior lip. Ray achenes 2.5-3 mm long, adaxially densely puberulent, abaxially glabrous, epappose, falling individually with subtending phyllaries. Disk achenes 2-2.5 mm long, uniformly sparsely puberulent; pappus of ca 25 unequal antrorsely scabrid bristles 2-4 mm long. Chromosome number unknown.

Distribution. Known only from the type collection in southern Oaxaca.

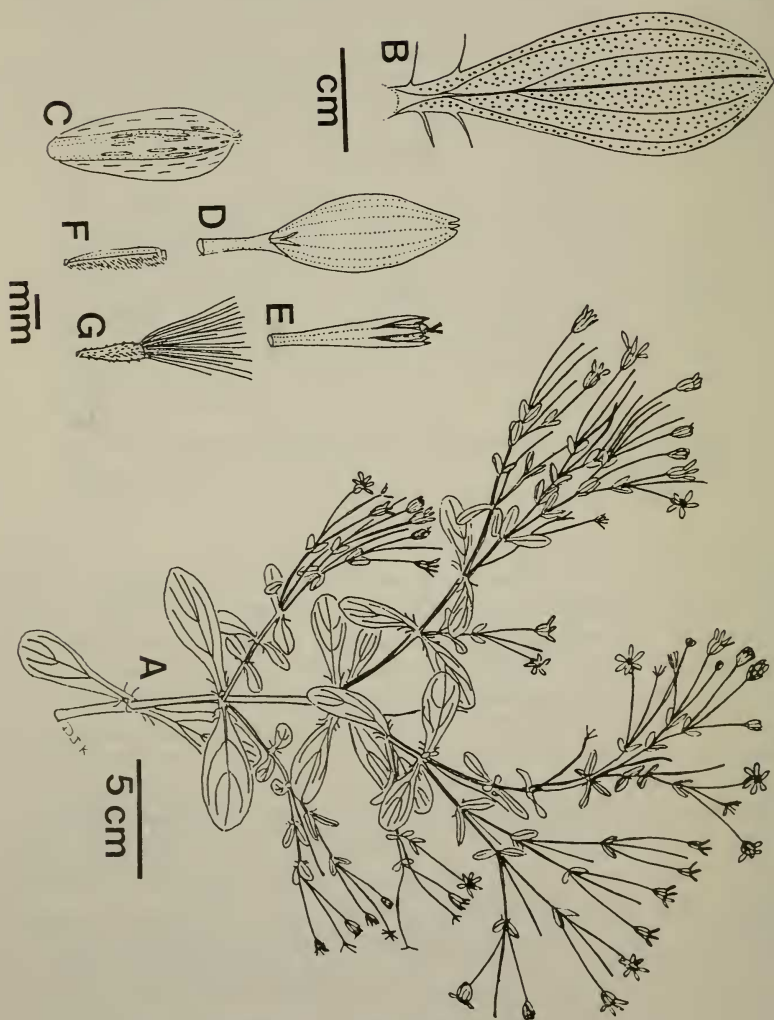


Figure 1. *Pectis amphifolia* Keil. A. Habit. B. Leaf, abaxial surface. C. Phyllary. D. Ray corolla. E. Disk corolla. F. Ray achene, abaxial surface to the left. G. Disk achene. C-G, same scale. Drawn from Boege 3349 (MEXU).

Relationships. *Pectis amplifolia* probably is most closely related to *P. canescens*, also of coastal southern México, from which it differs in the much broader leaves, the numerous cymosely clustered heads, and the completely epappose ray achenes. It has the broadest leaves known in any species of *Pectis*-hence the specific epithet.

Pectis exilis Keil, *spec. nov.* (Figure 2). TYPE: MÉXICO. Jalisco: dry hills near Guadalajara, 6 Oct 1903, *Pringle 8760* (HOLOTYPE: US; Isotypes: ARIZ,ASU,BM,CAS(3),CM,E(2),F,FI(2),GH,GOET,K,L(3),LE,LL,M(2),MEXU,MICH,MO(2),MSC,MU,NMC,NY,P(2),PH,POM,PR,R,SMU,UC,Z).

Herbae annuae vel interdum perennes, odoratae. Caules gracilissimi, 5-30 cm longi, plerumque ubique diffuse cymosae, glabri vel puberuli. Folia anguste linearia, 1-3 cm longa, 1-1.5 mm lata, apice acuta vel setosa, proximale vel in longitudine omne ciliata paribus setorum 4-8, 1-2 mm longorum, glabra vel in margine et abaxiale in nerva media scaberula, lamina in quoque laterale nervi medii abaxiale punctata glandibus pellucidis 0.2-0.3 mm diametro in serie una vel seriebus duabus. Capitula aliquot ad usque numerosa in cymis dichasialibus diffusis foliatis; pedunculi filiformes, 1-3.5 cm longi, glabri, 1-3 bracteolis dispersis alternantibus squamiformibus vel setiformibus 1-2 mm longis. Involucra anguste cylindracea; phyllaria 5, lineari-oblancoolata, 3-5 mm longa, circa 0.7 mm lata, acuta, atropurpurea, glabra, aliquot glandibus subterminalibus ellipticalibus inconspicuis. Flosculi radii 5; corollae 2.5-5 mm longae. Flosculi disci 5-6; corollae 2-3 mm longae, bilabatae labio anteriore anguste 0.5-1 mm longae, circa 5-plo longiore quam 4 lobis labii posterioris. Achenia 2-4 mm longi, puberula; pappus constatus e paleis angustissimis setiformibus, radii 2-3, disci 4-5. Chromosomatum numerus ignotus.

Spicy scented, tap rooted annuals or occasionally perennials. Stems very slender, 5-30 cm long, usually diffusely cymose branched throughout, glabrous or puberulent. Leaves narrowly linear, 1-3 cm long, 1-1.5 mm wide, acute or bristle tipped, ciliate proximally or throughout with 4-8 pairs of bristles 1-2 mm long, glabrous or minutely scaberulous on the margins and abaxially on the midvein, dotted on the undersurface on each side of midvein with 1 row (rarely 2) of pellucid glands 0.2-0.3 mm diameter. Heads several to many in diffuse leafy dichasial cymes; peduncles filiform, 1-3.5 cm long bearing 1-3 scale-like to setiform bractlets 1-2 mm long, glabrous. Involucre narrowly cylindric; phyllaries 5, linear-oblancoolate, 3-5 mm long, ca 0.7 mm wide, acute tipped, dark purple, glabrous, bearing a few inconspicuous elliptical

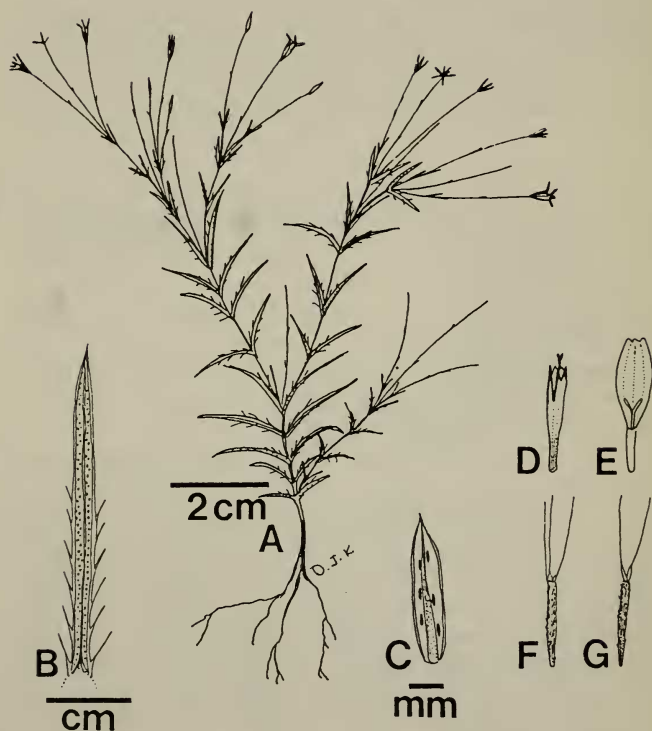


Figure 2. *Pectis exilis* Keil. A. Habit. B. Leaf, abaxial surface. C. Phyllary. D. Disk corolla. E. Ray corolla. F. Disk achene. G. Ray achene. C-G, same scale. Drawn from *Pringle 8760* (ASU).

subterminal glands. Ray florets 5; corolla 2.5-5 mm long, the tube 0.5-1 mm long. Disk florets 5-6; corolla 2-3 mm long, bilabiate with the anterior lip 0.5-1 mm long, ca 5 times the length of the 4 lobes of the posterior lip. Achenes 2-4 mm long, puberulent; ray pappus of 2-3 and disk pappus of 3-5 slender setiform scales 2-4 mm long. Chromosome number unknown.

Distribution. *Pectis exilis* is a seldom collected taxon that occurs in widely separated populations in western México from Jalisco to Oaxaca in open dry sites from 300-1700 m elevation. It flowers from August to October.

Populations in different areas have differentiated somewhat in their isolated condition. The plants collected near Guadalajara by Pringle and by Palmer are rather large and very highly branched. Plants collected by Hinton from Michoacán, on the other hand, are very tiny herbs with less branching. The plants in the only population that I have sampled (in Oaxaca) are intermediate in stature. Whether the observed differences in size are under genetic or environmental control cannot be determined without experimental study. Variation in head size, pappus and leaf form are probably genetically determined.

Relationships. *Pectis exilis* is probably most closely related to *P. linearis* Llave [= *P. capillaris* DC.], *P. diffusa* Hook. & Arn., and *P. uniaristata* DC. From *P. diffusa*, the new species differs by its much smaller, fewer flowered heads, and its usually annual habit.

The ranges of variation in size of reproductive parts of the *P. exilis*, *P. linearis* and *P. uniaristata* overlap, making quantitative characters difficult to use in characterizing the taxa. *Pectis linearis*, a plant of lowland habitats, has thinner leaves than does *P. exilis*, and these are commonly obtuse rather than acute to acuminate. The foliage of *P. linearis* is light green and the phyllaries are pale green to straw colored, whereas leaves of *P. exilis* are dark green, and the stems and involucre are commonly dark purple-brown. From the small headed races of *P. uniaristata* (var. *holostemma* A. Gray, var. *jangadensis* [S. Moore] Keil) the new species differs by its long, slender peduncles and very narrowly linear leaves. The larger headed race of *P. uniaristata* (var. *uniaristata*) typically is a much larger plant than *P. exilis*. It generally has broader leaves and larger heads than *P. exilis*.

The odor of *P. exilis* plants that I sampled in Oaxaca was "spicy," whereas both *P. diffusa* and the races of *P. uniaristata* are lemon scented (sometimes with a stinkbug-like odor also present in var. *holostemma*). The scent of other populations of *P. exilis* is unknown. The foliage of *P. linearis* is also "spicy scented" but differs from that of *P. exilis* (odors are difficult to characterize except by reference to "known" scents). The chemical constituents of the oils of these species have not been investigated.

Paratypes: MÉXICO. Guerrero: 10 km NE of Xaltianguis on road to Terra Colorado, 2 Nov 1972, Rzedowski 29766 (ENCB). Jalisco: 16 km N of Za-

popan, 9 Nov 1962, *McVaugh 22116* (MICH); Guadalajara, Río Blanco, 5 Nov 1889, *Pringle 2761* (F,MEXU). México: Luvianos, 26 Sep 1933, *Hinton 4815* (ENCB,F,GH,GH,K,LL,MICH,MO,NY,PH,US); Dist. Temascaltepec, Nanchitla, 31 Aug 1934, *Hinton 6521* (K). Morelos: San Raphael, SE of Tlaltizapan, 8 Nov 1964, *Ripley & Barneby 13711* (NY); barranca W of Cuernavaca, 6 Nov 1967, *Flores C. 197* (ENCB,OS). Oaxaca: along Hwy 175, 11 mi S of Ocatlan de Morelos, 28 Aug 1971, *Clarke 18726-7* (UC); 0.8 mi SE of turnoff to Mitla along Hwy 190, 13 Sep 1981, *Keil & Luckow 15526* (ASU,CHAPA,ENCB,MEXU,OBI,OS,UC); 10 km N of Zacatepec, 6 Nov 1979, *Koch, et al. 79377* (CHAPA,ENCB,TEX). Without location or date: *Haenke s.n.* (GOET,PR[2]); Paray 171 (MEXU).

***Pectis elongata* H.B.K. var. *fasciculiflora* (DC.) Keil, *comb. nov.* Based on *P. fasciculiflora* DC., Prodr. 5:100. 1836. TYPE: MÉXICO: without locality, 1791, *Haenke s.n.* (HOLOTYPE: G-DC! [IDC microfiche 800: 788: 1: 4]; Isotypes: F!,MICH!,P!,PR!).**

Strongly scented annual. Stems very compactly cymose above, the branches erect or closely ascending. Heads in dense clusters, sessile or peduncles seldom to 10 mm long. Phyllaries 3.5-6 mm long. Pappus of 0-4 bristles 3-4 mm long. Chromosome number unknown.

Distribution. Endemic to Guerrero between 50 and 400 m elevation, flowering from October to January.

Relationships. These plants are clearly a part of the *P. elongata* complex which ranges from the West Indies and México to Brazil. The var. *fasciculiflora* is easily distinguished from var. *floribunda* (A. Rich.) Keil, the only other race known to occur in México, by its very compact clusters of heads. Peduncle length of occasional individuals of var. *fasciculiflora* approaches that of var. *floribunda*. The odor has been determined to be "stinkbug-like" from one collection (*Rzedowski 29767* [CAS]), a feature that it shares with some populations of the Central American var. *oerstediana* (Rydb.) Keil.

***Pectis holochaeta* (S.F. Blake) Keil, *comb. nov.* Based on *P. propetes* Greenm. var. *holochaeta* S.F. Blake, J. Wash. Acad. Sci. 25:322. 1935. TYPE: MÉXICO. México: Dist. Temascaltepec, Acatitlan, 23 Sep 1933, *Hinton 4797* (HOLOTYPE: US!; Isotypes: K!,MO!,TEX!).**

Unscented prostrate to ascending annuals, simple or more commonly branched from the base, often mat forming and sometimes radicate. Stems 5-45 cm long, stramineous to dark brown-purple, subglabrous to villous in lines or villous throughout. Leaves linear to oblong, 1.5-4 cm long, 2-8 mm broad, acute to obtuse, ciliate proximally and sometimes to the apex with 6-15 pairs of bristles 1-2 mm long, with the base sclerified and more or less amplate,

stramineous to dark purple and appressed to stem, the blade dark green adaxially, lighter abaxially, punctate with numerous scattered round glands 0.1-0.2 mm diameter, glabrous to densely villous or hirtellous on adaxial surface and abaxially on the midvein, scaberulous on margins, proximally villous-ciliolate. Heads pedunculate, solitary or in few headed terminal cymes; peduncles 10-45 mm long, stout, purplish, minutely puberulent to densely villous with fine multicellular trichomes 0.2-0.5 mm long, bracteolate with ca 5 scale-like to foliaceous bractlets, the upper ca 5 mm long, setose tipped. Involucres broadly to narrowly campanulate; phyllaries 5, coriaceous, lacking a hyaline or scarious margin, greenish to dark purple, strongly imbricate, oblong to obovate, 6-8 mm long, 2.5-4.5 mm broad, obtuse to strongly retuse with a flaring apex, strongly indurate keeled to the apex, longitudinally nerved with several prominent secondary veins, sparsely punctate on margins and near apex with small round to elliptical glands 0.1-0.2 mm diameter, glabrous to densely hirtellous or villous with multicellular trichomes 0.2-0.3 mm long. Ray florets 5; corollas bright yellow, often abaxially purplish, 6-10 mm long, with the ligule 5-8 mm long, ca 2 mm broad and the tube 1.25-2.5 mm long, glabrous. Disk florets 11-24; corollas yellow, 5.0-6.75 mm long, the tube 1.5-2.0 mm long, the throat 0.5-1.25 mm long and the 5-lobed strongly bilabiate limb 2.5-4.0 mm long, the anterior lip 4-5 times the length of the lobes on the posterior lip, sparsely puberulent on the limb with minute gland tipped trichomes; anthers exserted laterally, 2-3 mm long; style exserted. Ray achenes 4-5 mm long, adaxially densely pilose with slender spreading bicellular trichomes 0.5-1.0 mm long, abaxially glabrous. Disk achenes 3.5-4.5 mm long, usually slightly shorter than the ray achenes, uniformly densely pilose on all sides. Ray pappus of 2(3-5) lance-acuminate scales 1.5-4.0 mm long; disk pappus usually slightly longer, of 5(4-6) equal to markedly unequal lance-acuminate scales 2.0-4.75 mm long.

Distribution. Endemic to south central México where it occurs in southeastern Michoacán, southwestern México and northwestern Guerrero at 275-1000 m elevation. Flowering from August to October.

Relationships. This species was originally named as a variety of *Pectis propetes* Greenm., a taxon to which it is evidently related. Individuals of *P. holochaeta* are generally much more robust than those of *P. propetes* and have larger heads and floral structures (e.g., phyllaries 6-8 mm vs 5.5-6; disk corollas 5-6.75 mm vs 3.5-4 mm; pappus scales 2-4.75 mm vs 1-1.25 mm). The range of *P. holochaeta* is disjunct by ca 500 km from the nearest known population of *P. propetes* and no intermediate forms are known. It seems more appropriate to treat the two as specifically distinct. *Pectis holochaeta* itself consists of two geographical races.

P. holochaeta (S.F. Blake) Keil var. *holochaeta*

Leaves equaling to slightly longer than adjacent internodes, mostly 3-8

mm broad, glabrous or nearly so, the indurate bases prominently ampliate. Peduncles mostly 2-4 cm long, minutely puberulent. Phyllaries 3-4.5 mm broad, glabrous. Disk florets 17-24; anthers ca 0.25 mm shorter than corolla limb. Chromosome number: $n=12$.

Distribution. Southeastern Michoacán, southwestern México and northwestern Guerrero. Of the two races, var. *holochaeta* is apparently the more widespread taxon. The limits of its range are not well known. Sampling has been limited for the most part to a few major roads.

This taxon is locally abundant in open grassy sites, sometimes coloring fields yellow. Its usually prostrate habit apparently protects it from grazing and its abundance in some heavily grazed areas suggests that it has benefited from disturbance.

Chromosome counts. MÉXICO. Guerrero: 2.2 mi E of turnoff to Arcelia on Rte 51, $2n=12_{II}$, 6 Sep 1981, Keil & Luckow 15369 (OBI); 0.9 mi W of turnoff to Arcelia on Rte 51, $2n=12_{II}$, 6 Sep 1981, Keil & Luckow 15370 (OBI); 4.2 mi SW of Coyuca de Catalan, $2n=12_{II}$, 7 Sep 1981, Keil & Luckow 15402 (OBI). Michoacán: 3.4 mi NW of rd to Bejucos on rd to Arroyo Grande, $2n=12_{II}$, 6 Sep 1981, Keil & Luckow 15384 (OBI).

***Pectis holochaeta* var. *cana* Keil, var. nov.** TYPE: MÉXICO. Michoacán: 9 mi NW of Cd. Altimirano on road to Huetamo, ca 370 m, *Acacia-Cathescium* association, $2n=12_{II}$, 7 Sep 1981, Keil & Luckow 15389 (HOLOTYPE: UC; Isotypes: ASU, CHAPA, ENCB, F, GH, MEXU, MO, NY, OBI, OS, RSA, US).

Folia saepe longiore quam internodis, plerumque 2-3 mm lata, dense canescentia, basibus induratis non valde ampliatis. Pedunculi plerumque 1-2 cm longi, canescentes. Phyllaria 2.5-3.5 mm lata, canescentia. Flosculi disci 11-20; antherae circa 0.5-1 mm longae, breviores quam limba corollae. Chromosomatum numerus: $n=12$.

Leaves often longer than adjacent internodes, mostly 2-3 mm broad, densely canescent, the indurate bases not markedly ampliate. Peduncles mostly 1-2 cm long, canescent. Phyllaries 2.5-3.5 mm broad, canescent. Disk florets 11-20; anthers ca 0.5-1 mm long, shorter than the corolla limb. Chromosome number: $n=12$.

Distribution. Known only from the area between Cd. Altimirano and Huetamo in southeastern Michoacán.

Pectis holochaeta var. *cana* is easily recognized by its dense canescence. The heads are somewhat smaller than those of var. *holochaeta*. A few populations intermediate in this character between var. *holochaeta* and var. *cana* occur near Cd. Altimirano.

Paratypes. MÉXICO. Michoacán: 10.9 mi NW of Cd. Altimirano on road to Huetamo, $2n=12_{II}$, 7 Sep 1981, *Keil & Luckow 15391* (OBI); 13.8 mi NW of Cd. Altimirano on road to Huetamo, ca 275 m, 7 Sep 1981, *Keil & Luckow 15392* (OBI); 16.2 mi NW of Cd. Altimirano on road to Huetamo, 7 Sep 1981, *Keil & Luckow 15394* (OBI); 7.2 mi SE of Huetamo, $2n=12_{II}$, 7 Sep 1981, *Keil & Luckow 15395* (OBI).

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